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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,107	09/12/2003	David H. Hwang	42P16017	9100

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EXAMINER

GABOR, OTILIA

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/662,107

Applicant(s)

HWANG, DAVID H.

Examiner

Otilia Gabor

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 and 21-27 is/are allowed.
- 6) ☒ Claim(s) 12-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Response to Amendment

1. The amendment filed 07/19/2005 has been entered.

Specification

2. The disclosure is objected to because of the following informalities: the title includes a spelling error "diffraction" should be --diffraction--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 12, 13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Purvis, Jr. et al. (U. S. Patent 5,540,494).

Purvis discloses a system and method for determining critical characteristics, such as, the size of a feature, the system comprising: a stage (manifold) to hold the subject structure (sample) that includes a feature (particle) with a size (radius) to be measured; a radiation source (laser) to emit radiation directed at the feature; a detector (photodiode, PMT) to detect a diffraction pattern caused by the radiation interacting with the feature and to generate a signal representative of at least in part of the diffraction pattern; and a computer coupled to the detector to receive the signal and to compare a

feature size identifier of the diffraction pattern with a library of feature size identifiers, each feature size identifier in the library being associated with a known feature size (see Figs.1, 2, 3, 5, 7, 25-28, Col.4, line 60-Col.7, line 65, Col.45, line55-Col.47, line 20). In operation, the subject having a feature (particle) is irradiated with light from the laser light source to form a diffraction pattern; the diffraction pattern is detected using a detector; and the particle size (radius) is determined based on a comparison between the measured size (which is done through measuring the diffraction pattern intensity) and the reference sizes saved in the library of the computer (see Figs.25-28).

Purvis discloses that his method works when the light is reflected and/or transmitted by the sample and thus the detection is inherently positioned on the same and/or opposite side from the feature depending on what type of measurement (reflected or transmitted) is being done. Purvis discloses that the feature size identifier is an envelope plot whereby the positions of the diffraction minimas and maximas are plotted and detected using the detector (see Figs.2). Purvis discloses that the feature size (particle radius) is calculated.

Regarding claim 13 Purvis discloses that the radiation source is a laser (see Fig.1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 17, 18, 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Purvis and further in view of Littau et al. (U. S. Patent 6,429,930).

Purvis discloses a general method of determining the size of a feature using its diffraction pattern, however it fails to disclose that the feature comprises a transmissive window defined by a radiation-opaque microelectronic structure mask substrate and that there is a vacuum enclosure surrounding the source, the stage and the detector. However, these features are inherently present in a system where the feature, the size of which is to be determined, is a microelectronic structure. This is clearly shown by Littau, which discloses a system and method for determining the characteristics of a microelectronic structure using the diffraction signature difference analysis. Since the diffraction signature analysis method is applicable to many different features, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the Purvis method on the feature of Littau, and therefore, using the Purvis method on a feature that has a window defined by a radiation-opaque microelectronic structure mask substrate where the source, detector and the stage are enclosed in vacuum. Littau discloses that high -energy beam and/or X-rays can be used as radiation sources besides the disclosed laser source.

7. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Purvis.

Purvis fails to disclose that the laser source is a helium-neon source emitting

radiation having a wavelength of about 633 nanometers and that the detector is a charge-coupled-device, however since he does not put a limitation as to the type of laser sources and detectors that can be used, and since he discloses using a radiation of wavelength 618 nanometers, it would have been obvious to use the claimed light source and detector, since CCD's and helium-neon lasers are well known and conventionally used in this field, and thus it would have been obvious to one having ordinary skill in the art to substitute one for the other.

Allowable Subject Matter

8. Claims 1-11, 21-27 are allowed.
9. The following is a statement of reasons for the indication of allowable subject matter: The amendment made by the Applicant to more clearly define the invention, namely, that the feature the size of which is to be measured is substantially static relative to the radiation source, renders the claim allowable over the prior art cited.

Response to Arguments

10. Applicant's arguments filed 07/19/2005 have been fully considered but they are not persuasive. The argument regarding claim 12 that the manifold that holds the sample is not equivalent to the claimed stage that holds the subject is not persuasive because as long as the manifold is used to hold the sample feature it fulfills the same function as the claimed stage, even more so given that there is no specific stage feature claimed that would differentiate the claimed stage from the manifold besides that it

holds the sample feature. The argument that the references cannot be combined because the pertinent fields are not compatible, is not persuasive, because both references deal with the general method of diffraction signature analysis in determining a characteristic of the sample under investigation, and as such, one of ordinary skill in the art working with diffraction analysis method would indeed be motivated to look at other diffraction methods regardless of the type of sample that is being investigated.

Conclusion

11. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Otilia Gabor whose telephone number is 571-272-2435.

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The examiner can normally be reached on Monday, Thursday-Friday between 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Otilia Gabor
Primary Examiner
Art Unit 2878



OTILIA GABOR
PRIMARY EXAMINER